Technical Paper 194

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U.S. BUREAU OF MINES
VAN. H. MANNING, DIRECTOR

REPORT OF THE COMMITTEE ON THE STANDARDIZATION OF MINING STATISTICS

COMPILED BY

ALBERT H. FAY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1918

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First edition. March, 1918.

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STANDARDIZATION OF MINING STATISTICS.

COMPILED BY ALBERT H. FAY.

INTRODUCTION.

In accordance with an invitation issued by the Secretary of the Interior to the governors of the various States, a convention of State mine inspectors and representatives of industrial compensation commissions was held in Washington February 24 and 25, 1916. The meeting was enthusiastic and all delegates and members showed the spirit of cooperation, all being thoroughly convinced of the necessity of standardizing all data relating to the reporting and classification of accidents. One of the principal objects of the meeting was to bring about a cooperative arrangement between the various State organizations and Federal bureaus interested in the collection of statistics relating to the mining industry.

With the view of simplifying the collection of statistics and, at the same time, relieving the operator of rendering so many reports, it was the consensus of opinion that figures once collected by a State organization should be sufficient for all purposes, and that the operator should not be called upon to render another report of a similar nature. It was the purpose of this meeting so to standardize and broaden the requests for data as to include in one report sufficient information for the State mine inspector, the State industrial compensation commission, and Federal bureaus.

The subject of the calendar year was brought up, and all members of the conference agreed that the calendar year should be adopted. The representatives of the States wherein the fiscal year is now at variance with the calendar year pledged themselves to do all they could to bring about legislative enactment to have the calendar year substituted. One of the principal arguments in favor of the calendar year was that, with the enactment of the Federal income-tax law, a report under oath was required of the exact financial conditions of the reporting company on December 31. This law being Federal applies to all of the States, and is an important argument in favor of the calendar year.

The discussion at the meeting during the first day of the conference related principally to proposed standard forms for recording and publishing data relating to mine equipment, labor, and accidents. The forms relating to mine equipment provide for a directory of

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mines in actual operation during a calendar year and for comprehensive data relating to power equipment, ventilating equipment, mining methods, and haulage systems.

With reference to accidents, a standard form was discussed that should so cover fatal and nonfatal accidents that complete and comparable information would be available in the published reports of the States for anyone interested in the study of accidents. The forms discussed were so grouped and general in their character as to include not only coal and metal mines, but metallurgical plants, quarries, and coke ovens.

The result of the meeting was the appointment of a committee to prepare standard forms along the lines proposed and discussed at this meeting. The coal-mining industry is represented on this committee by James E. Roderick, chief of the Department of Mines, Harrisburg, Pa., who was named chairman, and James Dalrymple, chief inspector of mines, Denver, Colo. The metal-mining industry is represented by George H. Bolin, State mine inspector, Phoenix, Ariz., and W. B. Orem, State metal-mine inspector, Helena, Mont. The other members of the committee are L. W. Hatch, chief statistician, New York Industrial Commission, Albany, N. Y.; John Bohlander, president Illinois State Mining Board, Pekin, Ill.; and Albert H. Fay, mining engineer, Bureau of Mines, who was named secretary of the committee.

The report of the committee follows:

REPORT OF THE COMMITTEE.

Hon. VAN. H. MANNING,

Director, Bureau of Mines, Washington, D. C.

SIR: The committee appointed by you on February 25, 1916, to consider the standardization of mine statistical forms, held a meeting at Atlantic City September 19, 20, and 21 for the purpose of reviewing the forms discussed at the February conference. Of the seven members of the committee only four were present, as follows: James E. Roderick, chief of the Department of Mines, Harrisburg, Pa., chairman; James Dalrymple, chief inspector of mines, Denver, Colo.; L. W. Hatch, chief statistician, New York Industrial Commission, Albany, N. Y.; and Albert H. Fay, mining engineer, Bureau of Mines, Washington, D. C., secretary. The following members of the committee were absent: George H. Bolin, State mine inspector, Phoenix, Ariz.; W. B. Orem, State metal-mine inspector, Helena, Mont., and John Bohlander, president Illinois State Mining Board, Pekin, Ill.

Inasmuch as the members of the committee representing the metal-mine industry were not present, we did not feel justified in making any extensive recommendations that would have a bearing upon metal mining. The work was therefore confined largely to the standardization of forms relating more particularly to the coal-mining industry.

REPORTS OF OPERATORS.

Forms 15, 16, 17, and 18 as published in the report of the conference held in Washington February 24 and 25, 1916, being the basic ones upon which the operator renders his report to the State mine inspector, were taken up and given first consideration

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and will be referred to hereafter as Forms 1, 2, and 3 (Forms 17 and 18 being combined as one). Form 1 has to deal with a directory, power equipment, ventilation equipment, mining, and labor. This form has been carefully gone into and is recommended as the standard form upon which mine operators may render monthly or annual reports direct to the State coal-mine inspector.

Form 2 relates especially to the metal-mining industry, and the only change suggested in this form is in part 2, relating to power equipment. It is suggested that the title be changed to read "power, pump, and haulage equipment"; in so doing it will be in conformity with the proposed form for the coal-mining industry and at the same time seemingly includes all of the necessary information for this part of the metal-mining equipment. With the exception of the substitution in the second part, Form 2 has not been otherwise changed.

Form 3, which relates to a standard accident report, was carefully considered from every phase of the mining industry, as well as from the requirements of the industrial compensation commissions. The form presented is believed to contain all of the information which will be needed by the departments of mines, State mine inspectors, industrial and compensation commissions. This form is to be filled out by the operator or his representative within 7 days of the accident (except that all fatal accidents are to be reported at once). This waiting period is specified by reason of the fact that from 50 to 60 per cent of the disabilities resulting from accidents will have terminated within the first week. A supplemental report for an injury which disables a workman more than 7 days should be sent in upon return to work or in any event at the end of 30 days.

PUBLIC RECORDS.

Forms 1 to 13 in the conference report will be referred to in this report as Tables 1 to 13. They show the character of information obtainable from Forms 1, 2, and 3 that should be tabulated and published by the State departments of mines or State mine inspectors. If assembled on this basis the data of each State will be comparable with those published by its neighbor. Tabulation based on the tables outlined will make available a large amount of standard information that may be used by Federal bureaus and all others interested in the question of mine statistics.

DIRECTORY OF MINES.

It would seem advisable for each State to prepare and publish in its annual report a directory of the mines that did any work during the year under consideration. As an outline for such a directory the accompanying Table 1 may be modified to suit any and all mines, metallurgical plants, and quarries. A directory thus compiled would have the advantage of being thoroughly reliable, having been prepared by a State official and published by the State. It would be of more than local value as, by exchange of reports, it would place before all of the other inspectors and State officials a complete list of all operating mines.

MECHANICAL EQUIPMENT OF MINES.

The accompanying tables, showing the equipment at mines, quarries, and metallurgical plants, are presented in order that more complete information may be furnished concerning efficiency and safety.

Table 2 shows an outline for power equipment that would be adaptable to any mine, quarry, or metallurgical plant.

Table 3 shows the ventilating equipment for coal mines. Published information of this character would show that the companies are complying with the law by stating the actual amount of air reaching the working face.

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Table 4 shows the kind and number of mining machines in use in the coal mines and the amount of coal produced by hand and machine mining. The kind and amount of explosives are tabulated in connection with the method of mining. This information is desirable inasmuch as the use of explosives is one of the principal hazards in all mines.

Table 5 shows the mining and ventilation equipment at metal mines. This separate form has been prepared because the mining operations, ventilation, types of machinery, etc., in metal mines differ materially from those in coal mines.

Therefore the committee recommends that the ventilation at metal mines shall be such that healthful conditions shall be maintained at the working faces at all times.

Table 6 shows the amount of coal produced and its distribution by principal uses.

ACCIDENTS BY INDUSTRIES.

In order that each mineral industry may be charged with its proper number of accidents, and at the same time receive credit for relative safety, the industries must be separated into groups.

Table 7. Accidents at metal mines should be separated from those at coal mines and at metallurgical plants. Accidents at metallurgical plants should not be charged to the mines, but should be segregated. In the various mineral mines it is further advisable that a number of representative groups should be maintained. For example, accidents at copper mines, iron mines, and the lead and zinc mines should be taken care of as individual items. The gold mines, silver mines, and many miscellaneous metal mines in the United States can not in most cases be separated; hence should be included in a single group. Mines of gypsum, graphite, phosphate rock, mica, and other nonmetals should be grouped by themselves and not included with metal mines. Only few of the latter types of mines, however, are large enough to be taken care of as an individual item.

Fatalities due to natural causes, as well as suicide and murder, should not be charged to the mining industry; nor should accidents to nonemployees be included, except those engaged in rescue and recovery work.

Table 8 is a tabular statement showing the information that should be published relating to all fatal accidents. As outlined, this form may be adapted to coal mines, metal mines, quarries, metallurgical plants, or any other branch of the mineral industry simply by changing the title of the table to cover the particular industry desired, the items regarding the fatalities to remain the same. It would seem advisable that a paragraph descriptive of each fatality be given in the text of the report. This paragraph should give all available details having any bearing whatever on the cause of the accident.

Table 9, which originally was intended to show a published chronological list of nonfatal injuries (identical with Table 8), was considered too cumbersome to be published, and the form submitted herewith is to be used in its stead.

This form enumerates by causes and degrees of disability all nonfatal injuries and will occupy only one page of an annual report, whereas the printed list of nonfatals might occupy many pages. The form as submitted here is for coal mines only and shows the accidents by causes as related to this industry. If another industry is desired, the same form may be used by simply substituting under the "causes" a list of causes which pertain to the industry in question, as, for example, metal mines (Table 9a), quarries (Table 9b), metallurgical plants (Table 9c); the forms (list of causes) used by the Bureau of Mines are recommended as being the ones to use therein.

ACCIDENTS BY OCCUPATION.

Data showing accidents by occupation are meager in the extreme. Many of the inspectors' reports, however, show the occupation of each injured man, but few of them give the number of men employed in the specified occupations. In order to

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compare and determine the relative hazards of different occupations, it is absolutely necessary to know, in addition to the number of men killed, the actual number of men employed in each occupation (Table 10 for coal mines and Table 12 for all other mines). Tables 11 and 13 call for a statement as to causes of accidents and as to the occupation of each victim, so that from data compiled in accordance therewith it would be possible to compare the various hazards, both by occupations and by physical causes of accidents.

At the bottom of Tables 11 and 13 is a space for the total number of men employed in each occupation, as given in Tables 10 and 12, for both coal and metal mines. The tables also call for a statement as to the number of days each mine was operated during the year.

LACK OF UNIFORMITY IN PUBLISHED REPORTS.

Legislative enactments relating to mine inspection and workmen's compensation in the various States are far from being uniform. One point of difference is the year covered by the report. Many of the States have fiscal years coinciding with the calendar year, whereas in other States the fiscal year ends in May, June, September, or November. With years covering such varying periods, it is not easy to classify matter relating to the mines so that information reported by one State will be comparable with that reported by another State. It would seem, therefore, that an effort should be made to have all of the reports coincide with the calendar year.

Many other features of the reports are not uniform. This is especially noticeable as to the classes of mines the inspection service should cover. The mines subject to inspection differ; in some States all mines are included, whereas in others only those mines employing 5, 10, or 20 men underground are included. Compensation laws in most States apply to all mines, but in some they are elective at the option of the operator. Hence those operators who do not choose to accept State compensation will not be included in the commission's report, so that the report will not include all mines for the year in question.

The forms and tables contained herein have been approved by the committee with the hope that they will be of aid in establishing a uniform system for recording and publishing data relating to the mining industry, with special reference to the various phases of mine accidents.

In order that statistics may be of greatest value to the mining industry at large, they must be collected and tabulated on a standard basis. With the introduction of compensation laws, it is absolutely essential that accurate and reliable data be available in order that proper insurance rates may be established. Furthermore, uniform and complete details offer the inspectors, miners, operators, and all others interested an opportunity to make true comparisons as to conditions in other States and with other mines in the same State or district.

RECOMMENDATIONS.

It is recommended by the committee:

1. That all statistical reports be rendered for the calendar year.

2. That there should be an effort on the part of the Federal Government to establish a statistical clearing house to prevent duplication of reports, and that the information once collected for a department or bureau should be made available for use by any other Federal department, bureau, or State government.

3. That, while all of the information called for by these forms is desirable, it is definitely known by the committee that some of the States may find it impracticable to adopt them immediately by reason of the fact that they are hampered by insufficient appropriations. The committee therefore earnestly requests that each State shall provide sufficient funds so that its proper official may comply with the recommendations contained herein.

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4. That copies of this report be printed by the Federal Bureau of Mines and given as wide circulation as possible by mailing copies to Members of Congress, governors, departments of mines, mine inspectors, industrial commissions, and operators in each State.

5. It is further recommended that all persons interested in the mining industry do all in their power to have the State mining laws so amended as to provide for the collection of the data called for by the standardized forms.

RECOMMENDED FORMS.

The standard forms referred to in recommendation No. 5 are appended hereto, and submitted with the hope that they may serve the purpose for which they are intended, namely, the publication of uniform statistics of the mining industry.

Respectfully submitted.

JAMES E. RODERICK,
Chief, Department of Mines, Harrisburg, Pa., Chairman.
L. W. HATCH,
Chief Statistician, New York Industrial Commission, Albany, N. Y.
JAMES DALRYMPLE,
Chief Inspector of Mines, Denver, Colo.
ALBERT H. FAY,
Mining Engineer, Bureau of Mines, Washington, D. C., Secretary.

SEPTEMBER 28, 1916.

STANDARD FORMS RECOMMENDED BY THE COMMITTEE.

The standard forms recommended by the committee are given in the following pages. They include the General Forms 1, 2, and 3, which are the only ones that are to be filled out by the operator for the proper State official, and Tables 1 to 13, which may be compiled from the operators' reports, for publication in the State's annual reports. Forms 1 and 3 are to be used for coal-mine reports; Forms 2 and 3 to be used by metal mines and metallurgical works; and Form 2, by a slight modification as the elimination of the part relating to ventilation, substituting the word "quarry" for "mine," with possibly a few other minor changes, together with Form 3 may be used for quarry reports.

Some of the tables, as 2, 3, 4, 5, 6, 10, and 12, provide for publishing details by companies. This may be more than some States can do, and in that event it is recommended that a summary statement be published showing by State totals all items that can be thus grouped.

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FORM 1.—*Form for reporting coal-mine equipment, production, and employees.*

COAL-MINE REPORT FOR THE CALENDAR YEAR ENDED DEC. 31, ——

(To be filled in by operator, a separate report for each mine.)

1. Directory.

1. Name of operator.....
2. Name of mine..... 3. County.....
4. Manager or general superintendent..... 5. Post office.....
6. Superintendent..... 7. Mine post office.....
8. Railroad to mine.....
9. Geological name of coal bed worked..... Thickness, feet ..... inches.....

2. Power, pump, and haulage equipment.

A. Power plant:
   1. Cylindrical boilers..... Number..... Total horsepower.....
   2. Tubular boilers..... Number..... Total horsepower.....
   3. Steam engines..... Number..... Total horsepower.....
   4. Internal combustion engines (gas)..... Number..... Total horsepower.....
   5. Dynamos..... Number..... Total kilowatts.....

B. Pumps:
   1. Number.....
   2. Total capacity in gallons per minute.....
   3. Number of pumps delivering water to surface.....
   4. Approximate number of gallons per minute delivered to surface.....

C. Haulage:
   1. Number of horses and mules.....
   2. Number of locomotives: Gasoline..... Steam..... Compressed air..... Electric.....
   3. Air compressors:
      Number..... Total capacity (cubic feet per minute).....

3. Ventilating equipment.

1. Name of operator and mine.....
2. Kind of opening: Shaft (depth).....feet. Drift (length).....feet.
   Slope (length).....feet. Dip.....degrees.
3. Gaseous or nongaseous mine [a].....
4. Number and type of safety lamp used: Flame.....
   Electric.....
5. Method of ventilation.....
6. Name of fan.....
7. Diameter.....feet.
8. Revolutions per minute.....
9. Water gage developed.....inches.
10. Power used.....
11. Number of splits of air currents.....
12. Cubic feet air per minute entering mine.....
13. Cubic feet air per minute circulating in each split..... No. 1, ... cubic feet. No. 2, ... cubic feet. No. 3, ... cubic feet. No. 4, ... cubic feet. No. 5, ... cubic feet.
14. Cubic feet air per minute passing out outlet.....

[a] A gaseous mine is one generating explosive gas in quantities sufficient to be detected by an approved safety lamp.

4. Machines, production, and explosives.

A. Machines:
   1. Compressed air: Number.....
   2. Electric: Number.....

B. Production: [a]	Short tons.
1. Loaded at mines for shipment.....	.....
2. Sold to local trade and used by employees.....	.....
3. Used at mines for steam and heat.....	.....
4. Made into coke.....	.....
5. Total production.....	.....
6. Coal mined by machines.....	.....
7. Coal mined by hand.....	.....
8. Coke produced [b].....	.....

C. Explosives:
   1. Black powder used.....kegs (or ..... pounds).
   2. Dynamite used.....pounds.
   3. Permissibles used.....pounds.

[a] See comments on p. 30. [b] See comments on p. 30.

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FORM 1.—*Form for reporting coal-mine equipment, production, and employees*—Continued.

COAL-MINE REPORT FOR THE CALDNDAR YEAR ENDED DEC. 31, ———Continued.

5. Men employed.[a]	A. Underground employees (average):	Number.
	1. Foremen	
	2. Assistant foremen	
	3. Fire bosses	
	4. Pick miners	
	5. Machine miners	
	6. Machine runners and scrapers	
	7. Shot firers	
	8. Drivers and runners	
	9. Motormen and assistants	
	10. Door boys and helpers	
	11. Trackmen and brattice men	
	12. Timbermen and rockmen	
	13. Pump and pipe men	
	14. Electricians and helpers	
	15. All others	
	Total underground	
	B. Surface employees (average):	
	1. Superintendents	
	2. Foremen	
	3. Blacksmiths and carpenters	
	4. Engineers and firemen	
	5. Machinists and helpers	
	6. Trackmen and helpers	
	7. All others at mine	
	Total surface employees at mines	
	Total mine employees, underground and surface	
	8. Coke employees	
	9. Office employees	
	Grand total	
6. Days worked.	C. Number of days mine was operated each month during year	
	Jan. ..... Feb. ..... Mar. ..... Apr.	
	May ..... June ..... July ..... Aug.	
	Sept. ..... Oct. ..... Nov. ..... Dec.	
	D. Number of days coke ovens were operated during year	

Additional questions, such as may be required by State laws and not included above, may be added here if desired.

(Signed) .....,
Superintendent or Manager.

Date .....

[a] See comments on p. 30.

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FORM 2.—*Form for reporting metal-mine equipment, production, and employees.*

METAL-MINE REPORT FOR THE CALENDAR YEAR ENDED DEC. 31, ——.

(To be filled in by operator, a separate report for each mine.)

1 Directory.

1. Name of operator.....
2. Name of mine..... 3. County.....
4. Manager or general superintendent..... 5. Post office.....
6. Superintendent..... 7. Mine post office.....
8. Railroad to mine.....
9. Principal ore produced.....
10. Kind of opening: Shaft (depth)....feet. Tunnel or adit (length)....feet.

2 Power, pump, and haulage equipment.

A. Power plant:
1. Cylindrical boilers..... Number..... Total horsepower.....
2. Tubular boilers..... Number..... Total horsepower.....
3. Steam engines..... Number..... Total horsepower.....
4. Internal-combustion engines (gas)..... Number..... Total horsepower.....
5. Dynamos ..... Number..... Total kilowatts.....

B. Pumps:
1. Number.....
2. Total capacity in gallons per minute.....
3. Number of pumps delivering water to surface.....
4. Approximate number of gallons per minute delivered to surface.....

C. Haulage:
1. Number of horses and mules.....
2. Number of locomotives: Gasoline..... Steam.....
Compressed air..... Electric.....
3. Air compressors: Number..... Total capacity (cubic feet per minute).....

3 Ventilation, machine drills, and explosives.

A. Ventilation:
1. Method..... 2. Name of fan.....
3. Kind of power used.....
4. Number of cubic feet air per minute entering mine inlet.....
5. Number of cubic feet air per minute passing out at outlet.....

B. Machine drills:
1. Number..... 2. Kind..... 3. Power used.....

C. Explosives used, pounds:
1. Black powder.....
2. Dynamite.....
3. Permissibles.....

D. Mining method.....

4 Production.

To be decided upon by inspector and State geologist for each State, according to mineral product.

5 Men employed.

	Number.
A. Mine employees (average): (State whether underground or open pit.)	
1. Foremen and assistants	
2. Miners and helpers	
3. Muckers and trammers	
4. Timbermen	
5. Other laborers	
6. Total in mine	
B. Outside employees (average):	
1. At shops and yards	
2. At ore-dressing plants	
3. At smelters	
4. Office employees	
C. Total employees	
D. Number of days operated during year:	
1. Mine	
2. Ore-dressing plant	
3. Smelter	

Additional questions, such as may be required by State laws and not included above, may be added here if desired.

(Signed) .....,
Superintendent or Manager.

Date.....

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FORM 3.—*Proposed standard schedule for accident reports.*

FIRST REPORT OF INJURY[a] TO EMPLOYEE.

(To be filled out by operator and sent in within 7 days of the accident, except that fatal accidents are to be reported at once.)

Employer, place, and time.	1. Employer's name ..... 2. Office address, street and number ..... City or village ..... 3. Business (minerals or metals produced) ..... 4. Name of mine (quarry, mill, smelter, or plant) ..... Post office ..... County ..... 5. Date on which accident occurred ..... 6. Hour of day ..... 7. Hour injured person began work that day ..... 8. Name of foreman or person in immediate charge.
2 Injured person.	1. Name ..... 2. Address ..... 3. Age ..... 4. Single, married, widowed, or divorced ..... 5. Number of children under 16 years ..... 6. Nationality ..... Color ..... Speak English ..... 7. Regular occupation ..... 8. Occupation when injured ..... 9. Length of experience in occupation when injured ..... 10. Contract or time worker .... 11. Wages or average earnings per day ..... 12. Working hours per day ..... 13. Working days per week ..... 14. Did injured person have any physical defect of eye, ear, or otherwise .....
3 Cause.	1. Where did accident occur? ..... 2. If at mine, state whether in mine or on surface ..... 3. If at mine, state mining method ..... 4. Name of machine, tool, or appliance in connection with which accident occurred ..... 5. Was machine or appliance properly guarded? (Yes or no) ..... If "yes," describe character of guard .... 6. Give immediate cause of accident ..... 7. Describe fully how accident happened .... 8. Were there any eyewitnesses? .....give names ....
4 Nature and extent of injury.	1. Was accident fatal? If so, give date of death ..... 2. State exactly part of person injured and nature of injury .... 3. Did injury cause loss of any member or part of a member? If so, describe exactly .... 4. Attending physician or hospital where sent; name and address .... 5. Has injured person returned to work? .....If so, give date and hour. ..... If not, give estimate of length of disability .... 6. Name of insurance carrier ..... (Signed) ..... *Superintendent or Manager.* Date of report .....
.....	.....
5 Supplemental report.	If employee is disabled, detach here, sending in supplemental report upon return to work, in any event, at the end of 30 days. If employee is not disabled, or if death resulted, fill in but do not detach. 1. Date of previous report ..... 2. Name of employer ..... 3. Office address: Street and number ..... City or town ..... 4. Name of injured employee ..... 5. Present address of employee: Street and number ..... City or town ..... 6. Has injured person returned to work? ..... Date of return ..... 7. At what occupation? ..... 8. Present rate of wages per week ..... 9. Number of days lost ..... 10. If injured person has not yet returned, state estimate of further disability. ..... (Signed) ....., *Superintendent or Manager.* Date of report .....

[a] A reportable injury shall be one that causes any loss of time or requires any medical attention.

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TABLE 1.—*Directory of coal mines in State of —— for the calendar year ended Dec. 31, ——*

Name of operator.	Name of mine.	County.	Name of manager or general superintendent.	Post office.	Name of superintendent.	Mine post office address.	Railroad to mine.	Geological name or number of coal bed worked.	Average thickness.	
									Feet.	Inches.
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TABLE 1a.—*Directory of metal mines*[a] *in State of —— for the calendar year ended Dec. 31, ——.*

Name of operator.	Name of mine.	County.	Name of manager or general superintendent.	Post office.	Name of superintendent.	Mine post office address.	Railroad to mine.	Principal ores produced.	Kind of opening.	
									Shaft—depth.	Adit—length.
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[a] This table may be adapted to metallurgical plants, quarries, or coke ovens by omitting the last three columns and changing the title.

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TABLE 2.—*Power equipment of mines, quarries, and metallurgical plants*[a] *in State of* —— *for the calendar year ended Dec. 31,* ——.

Name of operator.	Name of mine.	Power plant.										Pumps.				Haulage.					Air compressors.	
		Boilers.				Engines.								Pumps delivering water to the surface.			Number of locomotives.					
		Cylindrical.		Tubular.		Steam engines (all classes).		Internal combustion engines (gas).		Electric dynamos (all classes).		Number.	Total capacity, gallons per minute.			Number of horses and mules.					Number.	Total capacity, cubic feet per minute.
		Number.	Total horsepower.	Number.	Total horsepower.	Number.	Total horsepower.	Number.	Total horsepower.	Number.	Total kilowatts.			Number.	Total gallons per minute.		Gasoline.	Steam.	Compressed air.	Electric.		

[a] This is a general title, and should be changed to conform to the particular industry upon which report is being made. Do not combine metal mines with coal mines or quarries. Use separate form for each main group.

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TABLE 3.—*Ventilating equipment of coal mines in State of —— for the calendar year ended Dec. 31, ——.*

Name of operator.	Name of mine.	Kind of opening.				Gaseous or nongaseous.[a]	Number and type of safety lamp used.		Method of ventilation.	Name of fan.	Diameter, feet.	Revolutions per minute.	Water gage, inches.	Kind of power used.	Number of splits of air current.	Number of cubic feet of air per minute entering the mine at inlet.	Total number of cubic feet of air per minute circulating in all the splits.	Number of cubic feet of air per minute passing out at outlet.	Number of persons employed (inside).
		Shaft, depth.	Slope.				Flame.	Electric.										
			Length.	Pitch, degrees.	Drift, length.													
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[a] A gaseous mine is one generating explosive gas in quantities sufficient to be detected by an approved safety lamp.

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TABLE 4.—*Mining machines and explosives used at coal mines during the calendar year ended Dec. 31, ——.*

Name of operator.	Name of mine.	Mining machines.		Coal (short tons) mined by—			Explosives used (pounds).		
		Number operated by compressed air.	Number operated by electricity.	Hand.	Machine.	Total.	Black powder.	Dynamite.	Permissible explosives.
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TABLE 5.—*Mining and ventilating equipment and explosives used in metal mines in State of —— during the calendar year ended Dec. 31, ——.*

Name of operator.	Name of mine.	Ventilation.					Machine drills.			Explosives used (pounds).			Mining method employed.
		Method used.[a]	Kind of power used.	Number of cubic feet air per minute entering mine inlet.	Number of cubic feet air per minute passing out at outlet.	Number of persons employed.	Number.	Kind of drill.	Kind of power used.	Black powder.	Dynamite.	Permissible explosives.	
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[a] Natural, fan, or furnace.

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TABLE 6.—*Production and distribution of coal from coal mines in State of —— during the calendar year ended Dec. 31, ——.*

[Short tons, 2,000 pounds.]

Name of operator.	Name of mine.	County.	Loaded at mines for shipment.	Sold to local trade and used by employees.	Used at mines for steam and heat.	Made into coke.	Total coal (tons).	Coke produced (tons.)

TABLE 7.—*Summary of men employed and accidents in the mineral industry during the calendar year ended Dec. 31, ——.*

Branch of mining industry, segregation of employees, and average days operated per year.	Days operated.	Average number of men employed.	Fatal.	Permanent total disability.[a]	Permanent partial disability.[b]	Temporary disability.		Total injuries.
						Time lost, more than 14 days.	Time lost, not more than 14 days.[c]	
Coal mines (anthracite):								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Coal mines (bituminous):								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Coke ovens:								
By-product								
Beehive								
Total								
Mineral mines:								
Iron—								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Copper—								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								

[a] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation. See also comments on p. 31.

[b] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability. See also comments on p. 31.

[c] In this column include only accidents which cause a loss of time more than the balance of the day or shift upon which the accident occurred.

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TABLE 7.—*Summary of men employed and accidents in the mineral industry during the calendar year ended Dec. 31,* ———Continued.

Branch of mining industry, segregation of employees, and average days operated per year.	Days operated.	Average number of men employed.	Fatal.	Permanent total disability.	Permanent partial disability.	Temporary disability.		Total injuries.
						Time lost, more than 14 days.	Time lost, not more than 14 days.	
Mineral mines—Continued.								
Precious metals—								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Lead and zinc—								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Miscellaneous metal—								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Nonmetal—								
Underground								
Open-pit mines								
Surface, shops, and yards								
Total								
Metallurgical plants:								
Ore dressing [a]								
Smelting [b]								
Total								
Quarries:								
In and about quarry								
Outside works [c]								
Grand total								

[a] Ore-dressing plants to include stamp mills, sampling works, slime plants, lixiviation, leaching, cyanide, and flotation mills.

[b] Smelters to include blast, reverberatory, and roasting furnaces; convertors, casting department, and refineries

[c] To include rock-dressing plants, crushers, cement mills, kilns, etc.

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TABLE 8.—*List of fatalities inside and outside of the —— mines,*[a] *in the State of—— during the calendar year ended Dec. 31, ——.*

Date of accident.	Name of person.	Nationality of employee killed.	Occupation.		Age.	Married or single.	Dependent members of family.			Name of operator.	Name of mine.	County.	Nature and cause of accident in brief.[b]	Where did accident occur?[c]
			Regular.	When injured.			Widow.	Children under 16 years.	Others.					
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[a] This is a general heading and should be modified to conform to each branch of the mining industry. Do not combine coal mines with metal mines or quarries. Make up a separate table for each. This form will also meet the requirements for reporting accidents at metallurgical plants and coke ovens.
[b] All fatal accidents to be described in detail in body of report by suitable text, to which reference will be made in this table.
[c] State whether accident occurred inside or outside of mine and where.

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TABLE 9.—*Number injured at coal mines during the calendar year ended Dec. 31, ——.*

Causes. (See comments on p. 31. Also Form A, p. 33.)	Fatal.	Permanent total disability.[a]	Permanent partial disability.[b]	Temporary disability.		Total injuries.
				Time lost, more than 14 days.	Time lost, not more than 14 days.[c]	
Underground:						
1. Falls of roof (coal, rock, etc.)						
2. Falls of face or pillar coal						
3. Mine cars and locomotives						
4. Gas explosions and burning gas						
5. Coal-dust explosions (including gas and dust combined)						
6. Explosives						
7. Suffocation from mine gases						
8. Electricity						
9. Animals						
10. Mining machines						
11. Mine fires (burned, suffocated, etc.)						
12. Other causes						
Total underground						
In shaft:						
13. Falling down shafts or slopes						
14. Objects falling down shafts or slopes						
15. Cages or skips						
16. Other causes						
Total in shaft						
On surface:						
17. Mine cars and mine locomotives						
18. Electricity						
19. Machinery						
20. Boiler explosions or bursting steam pipes						
21. Railway cars and locomotives						
22. Other causes						
Total on surface						
Grand total						

[a] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

[c] In this column include only accidents which cause a loss of time more than the balance of the day or shift upon which the accident occurred.

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TABLE 9a.—*Number injured at metal mines during the calendar year ended Dec. 31, ——.*

Causes. (See Form B, p. 34.)	Fatal.	Permanent total disability.[a]	Permanent partial disability.[b]	Temporary disability.		Total injuries.
				Time lost, more than 14 days.	Time lost, not more than 14 days.[c]	
Underground:						
1. Fall of rock or ore from roof or wall						
2. Rock or ore while loading at working face or chute						
3. Timber or hand tools						
4. Explosives						
5. Haulage system						
6. Falling down chute, winze, raise, or stope						
7. Run of ore from chute or pocket						
8. Drilling accidents						
9. Electricity						
10. Machinery (other than locomotives or drills)						
11. Mine fires						
12. Suffocation from mine gases						
13. Inrush of water						
14. Nails, splinters, etc						
15. Other causes						
Total underground						
In shaft:						
16. Falling down shafts						
17. Objects falling down shafts						
18. Breaking of cables						
19. Overwinding						
20. Skip, cage, or bucket						
21. Other causes						
Total in shaft						
On surface:						
22. Mine cars or mine locomotives, gravity or aerial trams						
23. Railway cars and locomotives						
24. Run or fall of ore in or from ore bins						
25. Falls of persons						
26. Nails, splinters, etc						
27. Hand tools, axes, bars, etc						
28. Electricity						
29. Machinery						
30. Other causes						
Total on surface (shops, yards, and power plants)						
Open pit:						
31. Falls or slides of rock or ore						
32. Explosives						
33. Haulage system						
34. Steam shovels						
35. Falls of persons						
36. Falls of derricks, booms, etc						
37. Run or fall of ore in or from ore bins						
38. Machinery (other than 33 and 34)						
39. Electricity						
40. Hand tools						
41. Other causes						
Total open pit						
Grand total						

[a] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

[c] In this column include only accidents which cause a loss of time more than the balance of the day or shift upon which the accident occurred.

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TABLE 9b.—*Number injured at quarries during the calendar year ended Dec. 31, ——.*

Causes. (See Form C, p. 36.)	Fatal.	Permanent total disability.[a]	Permanent partial disability.[b]	Temporary disability.		Total injuries.
				Time lost, more than 14 days.	Time lost, not more than 14 days.[c]	
In and about quarry:						
1. Falls or slides of rock or overburden						
2. Handling rock at face						
3. Timber or hand tools						
4. Explosives						
5. Haulage						
6. Falling into quarry from surface, benches, or face						
7. Falling from hoists, derricks, ladders, etc.						
8. Drilling and channeling						
9. Electricity						
10. Machinery						
11. Flying objects						
12. Nails, splinters, etc						
13. Boiler or air-tank explosions						
14. Steam shovels						
15. Other causes						
Total number injured at quarry						
Outside works:[d]						
16. Haulage						
17. Railway cars and locomotives						
18. Crushers						
19. Cranes, derricks, etc						
20. Other machinery						
21. Falls of persons						
22. Hand tools						
23. Electricity						
24. Nails, splinters, etc						
25. Flying objects						
26. Falling objects						
27. Burns						
28. Handling rock by hand						
29. Other causes						
Total number injured at rock-dressing plants and mills						
Grand total						

[a] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

[c] In this column include only accidents which cause a loss of time more than the balance of the day or shift upon which the accident occurred.

[d] To include rock-dressing plants, crushers, cement mills, kilns, etc.

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TABLE 9c.—*Number injured at metallurgical works during the calendar year ended Dec. 31, ——.*

Causes.	Fatal.	Permanent total disability.[a]	Permanent partial disability.[b]	Temporary disability.		Total injuries.
				Time lost, more than 14 days.	Time lost, not more than 14 days.[c]	
Ore-dressing and milling plants:[d]						
1. Haulage system						
2. Railway cars and locomotives						
3. Crushers, rolls, or stamps						
4. Tables, jigs, etc						
5. Other machinery						
6. Falls of persons						
7. Suffocation in ore bins						
8. Falling objects (rocks, timbers, etc.)						
9. Cyanide or other poisoning						
10. Scalding (steam or water)						
11. Electricity						
12. Hand tools, axes, bars, etc						
13. Nails, splinters, etc						
14. Flying pieces of rock from sledging or crushing						
15. Other causes						
Total number injured at mills						
Smelters:[e]						
16. Haulage system						
17. Railway cars and locomotives						
18. Cranes						
19. Other machinery						
20. Falls of persons						
21. Suffocation in ore bins						
22. Flying or falling objects (rocks, timbers, etc.)						
23. Gas (burns or asphyxiation)						
24. Scalding (steam or water)						
25. Electricity						
26. Hand tools, axes, bars, etc						
27. Nails, splinters, etc						
28. Burns from matte, slag, or molten metal (pouring or spilling)						
29. Hot-metal explosions						
30. Other causes						
Total number injured at smelters						
Auxiliary works (yards, shops, construction, etc.):						
31. Haulage systems, cars, motors, etc						
32. Railway cars and locomotives						
33. Falls of persons						
34. Falling objects (rocks, timbers, etc.)						
35. Nails, splinters, etc						
36. Hand tools, axes, bars, etc						
37. Electricity						
38. Machinery						
39. Failure of ladder, scaffold, or other support						
40. Handling hot materials						
41. Other causes						
Total number injured by shop and yard accidents						
Grand total						

[a] Permanent total disability: Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] Permanent partial disability: Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

[c] In this column include only accidents which cause a loss of time more than the balance of the day or shift upon which the accident occurred.

[d] Ore-dressing plants to include stamp mills, sampling works, slime plants, lixiviation, leaching, cyanide, and flotation mills.

[e] Smelters to include blast, reverberatory, and roasting furnaces; converters, casting department, and refineries.

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TABLE 10.—*Coal-mine employees classified by occupation in the State of —— during the calendar year ended Dec. 31, ——.*

| Name of operator. | Name of mine. | County. | | |

TABLE 11.—*Coal-mine fatalities in the State of —— classified by cause and occupation, during the calendar year ended Dec. 31, ——.*

Causes.	Underground and shaft.														Surface fatalities.	Total fatalities.
	1. Foreman.	2. Assistant foreman.	3. Fire bosses.	4. Pick miners.	5. Machine miners.	6. Machine runners and scrapers.	7. Shot firers.	8. Drivers and runners.	9. Motormen and assistants.	10. Door boys and helpers.	11. Trackmen and brattice men.	12. Timbermen and rock men.	13. Pump and pipe men.	14. Electricians and helpers.	15. All others.	Total fatalities underground.		
Underground:																		
1. Falls of roof (coal, rock, etc.)																		
2. Falls of face or pillar coal																		
3. Mine cars and locomotives																		
4. Gas explosions and burning gas																		
5. Coal-dust explosions (including gas and dust combined)																		
6. Explosives																		
7. Suffocation from mine gases																		
8. Electricity																		
9. Animals																		
10. Mining machines																		
11. Mine fires (burned, suffocated, etc.)																		
12. Other causes																		
Total underground																		
In shaft:																		
13. Falling down shafts or slopes																		
14. Objects falling down shafts or slopes																		
15. Cages or skips																		
16. Other causes																		
Total in shaft																		
On surface:																		
17. Mine cars and mine locomotives																		
18. Electricity (shock or burns)																		
19. Machinery																		
20. Boiler explosions or bursting steam pipes																		
21. Railway cars and locomotives																		
22. Other causes																		
Total on surface																		
Grand total																		
Number employed in each occupation [a]																		

[a] To be supplied from Table 10.

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TABLE 12.—*Number of each class of employees inside and outside of all mines (except coal mines) in State of —— during the calendar year ended Dec. 31, ——.*[a]

Name of operator.	Name of mine.	County.	Underground.						Open pit.						Surface employees, excluding office, mill, and smelter men.	Total employees.	Days mine was operated during year.
			Foremen and assistants.	Miners and helpers	Muckers and trammers.	Timbermen.	Other mine labor.	Total employed in mine.	Foremen and assistants.	Miners and helpers.	Muckers and trammers.	Timbermen.	Other mine labor.	Total employed in open-pit mine.			

[a] This form may be adapted for use at metallurgical plants, quarries, and coke ovens by changing occupations herein named.

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TABLE 13.—*Metal-mine fatalities in the State of ——, classified by cau e and occupation during the calendar year ended Dec. 31, ——.*

Cause.	Occupation in underground or open-pit mine.						Surface fatalities, excluding office, mill, and smelter employees.	Total fatalities.
	Foremen and assistants.	Miners and helpers.	Muckers and trammers.	Timbermen.	Other mine labor.	Total killed in mine.		
Underground:								
1. Fall of rock or ore from roof or wall								
2. Rock or ore while loading at working face or chute								
3. Timber or hand tools								
4. Explosives								
5. Haulage system								
6. Falling down chute, winze, raise, or stope								
7. Run of ore from chute or pocket								
8. Drilling accidents								
9. Electricity								
10. Machinery (other than locomotives or drills)								
11. Mine fires								
12. Suffocation from mine gases								
13. Inrush of water								
14. Nails, splinters, etc								
15. Other causes								
Total underground								
In shaft:								
16. Falling down shafts								
17. Objects falling down shafts								
18. Breaking of cables								
19. Overwinding								
20. Skip, cage, or bucket								
21. Other causes								
Total in shaft								
On surface:								
22. Mine cars or mine locomotives, gravity or aerial trams								
23. Railway cars and locomotives								
24. Run or fall of ore in or from ore bins								
25. Falls of persons								
26. Nails, splinters, etc								
27. Hand tools, axes, bars, etc								
28. Electricity								
29. Machinery								
30. Other causes								
Total on surface (shops, yards, and power plants)								
Open pit:								
31. Falls or slides of rock or ore								
32. Explosives								
33. Haulage system								
34. Steam shovels								
35. Falls of persons								
36. Falls of derricks, booms, etc								
37. Run or fall of ore in or from ore bins								
38. Machinery (other than 33 and 34)								
39. Electricity								
40. Hand tools								
41. Other causes								
Total open-pit								
Grand total								
Number employed in each occupation [a]								

[a] To be supplied from Table 12.

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SUGGESTIONS AND EXPLANATIONS.

In order to obtain the broadest possible view on the subject of mining statistics the foregoing report of the committee was submitted to the Federal bureaus that are more or less interested in statistics. A number of points which have been brought out, although received too late to be considered by the committee, are of sufficient importance to be added here for the benefit of those who may adopt the report either in whole or in part. These suggestions follow.

FORM 1.

PRODUCTION.

The United States Geological Survey comments upon question 4-B as follows: The production should include only salable coal. Provision should also be made for the following items to be inserted after No. 7:

No. 7a. Coal mined by being shot from the solid.

No. 7b. Coal mined from steam-shovel pits.

No. 7c. Coal obtained by washing.

No. 7d. State whether tons reported above are gross (2,240 pounds) or net (2,000 pounds).

COKE PRODUCED.

Question 4-B-8. Inasmuch as coke is produced by others than mining companies the returns given on reports of mining companies would not represent the entire coke production of that State. It would, therefore, be necessary for the State mine inspector, or other official, to obtain figures from coking companies that are not operating mines.

AVERAGE NUMBER OF EMPLOYEES.

The Bureau of Labor Statistics comments as follows: Question 5 calls for the average number of employees in each of the various occupations. Without instruction in regard to the way these averages should be computed, there will be a lack of uniformity in the method, and in many cases the figures submitted will not be averages and will not represent even approximately the real average number of persons employed. The definition given below has been adopted by the committee on statistics and compensation insurance cost of the International Association of Industrial Accident Boards and Commissions,[a] and it is intended that the reports prepared by the various State boards and commissions shall follow this rule so far as possible.

Average number of men.—(a) The basis used for the average number of men should be the actual number of man-hours for the year; that is, the total working time for all

[a] U. S. Bureau of Labor Statistics, Bull. 201, p. 102.

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employees of the establishment or the department for the year reduced to the number of hours required for one man to do the same work. This should be taken from exact records if such records are in existence. (b) If this exact information is not available in this form in the records, then an approximation should be computed by taking the number of men at work (or enrolled) on a certain day of each month in the year, and the average of these numbers multiplied by the number of hours worked by the establishment for the year would be the number of man-hours measuring the exposure to risk for the year.

The tabulation forms tentatively adopted by this committee [a] do not use the term, "Average number of employees," but, in place of it, "Number of full-time workers," a full-time worker being defined as a man employed 300 days of 10 hours each. The committee on statistics of course has had to recognize the fact that such exact information as the actual number of hours worked would not be obtainable in many cases, but they have taken the view that an attempt should be made to obtain such information and that the best approximation possible should be given, with a full statement as to any defects.

TABLE 7.

DISABILITIES.

The Bureau of Labor Statistics cites the definitions which have been tentatively adopted by the committee on statistics and compensation insurance cost of the International Association of Industrial Accident Boards and Commissions [a] as follows:

Permanent total disabilities: To this group should be assigned every injury which is designated by statute as permanent total disability, or which permanently incapacitates the workman from performing any work continuously in any gainful occupation.

Permanent partial disabilities: To this group should be assigned every injury less than permanent total disability which results in the loss of any member of the body or part thereof, or in the permanent impairment of any function of the body.

TABLE 9.

TABULATION OF ACCIDENTS BY CAUSES.

The Bureau of Labor Statistics comments as follows: In order to secure satisfactory results some definition or explanation to guide the various inspectors in the tabulation of causes is desirable. With this purpose in mind, the committee on statistics and compensation insurance cost of the International Association of Industrial Accident Boards and Commissions [a] adopted the following definition of "cause".

The accident should be charged to that condition or circumstance the absence of which would have prevented the accident, but if there be more than one such condition or circumstance, then to the one most easily prevented.

[a] U. S. Bureau of Labor Statistics, Bull. 201, page 13.

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APPENDIX.

ACCIDENT REPORT FORMS IN USE BY THE BUREAU OF MINES.

Although the committee agreed to adopt the general forms that are in use by the bureau, it did not include the amplified forms that are used at present. During the delay in getting out this report, a number of minor changes have been made on the bureau's form that introduce further subdivisions under the main numbered items. In view of these changes it is deemed advisable to add as an appendix to this report the forms that the bureau now uses.

Form A (identical with Table 9 as to numbered items) is used by the State inspectors for reporting monthly to the bureau the fatalities at the coal mines under their inspection. The numerous subdivisions under the various causes are deemed advisable, as they enable the real cause of the accident to be made plainer.

Form B (identical with Table 9a as to the numbered items) is the form which the bureau is now using in the collection of accident statistics at metal mines.

Form C is an amplified form of Table 9b and is used in the collection of accident statistics at quarries.

Form D shows the form used in the collection of accident statistics at coke ovens and does not appear in the committee's report.

Forms A, B, C, and D are printed below for the benefit of those who may desire to keep a more detailed classification of accidents and yet conform to the committee's report.

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FORM A.—*Form for reporting coal-mine fatalities to the Bureau of Mines, effective January 1, 1918. Reported monthly by the State coal-mine inspector.*

NUMBER KILLED IN COAL MINES DURING THE MONTH ENDED —— —, —.

	Killed.
NUMBER KILLED UNDERGROUND.	
1. Falls of roof (coal, rock, etc.):	
(*a*) At working face	
(*b*) In room or chamber	
(*c*) On road, entry, or gangway	
(*d*) On slope	
2. Falls of face or pillar coal:	
(*a*) At working face	
(*b*) On road, entry, or gangway	
3. Mine cars and locomotives:	
(*a*) Switching and spragging	
(*b*) Coupling cars	
(*c*) Falling from trips	
(*d*) Run over by car or motor	
(*e*) Caught between car and rib	
(*f*) Caught between car and roof while riding	
(*g*) Runaway car or trip	
(*h*) Miscellaneous	
4. Gas explosions and burning gas:	
(*a*) Due to open light	
(*b*) Due to defective safety lamps	
(*c*) Due to electric arc	
(*d*) Due to shot	
(*e*) Due to explosions of powder	
(*f*) Miscellaneous	
5. Coal-dust explosions (including gas and dust combined):	
(*a*) Due to open light	
(*b*) Due to defective safety lamps	
(*c*) Due to electric arc	
(*d*) Due to shot	
(*e*) Due to explosions of powder	
(*f*) Miscellaneous	
6. Explosives:	
(*a*) Transportation	
(*b*) Charging	
(*c*) Suffocation	
(*d*) Drilling into old holes	
(*e*) Striking in loose rock or coal	
(*f*) Thawing	
(*g*) Caps, detonators, etc	
(*h*) Unguarded shots	
(*i*) Returned too soon	
(*j*) Premature shot	
(*k*) Sparks from match, lamp, or candle	
(*l*) Delayed blast	
(*m*) Shot breaking through rib or pillar	
(*n*) Miscellaneous	
7. Suffocation from mine gases	
8. Electricity:	
(*a*) Direct contact with trolley wire	
(*b*) Bar or tool striking trolley wire	
(*c*) Contact with mining machine	
(*d*) Contact with machine feed wire	
(*e*) Contact with haulage motor	
(*f*) Miscellaneous	

	Killed.
NUMBER KILLED UNDERGROUND—contd.	
9. Animals	
10. Mining machines (other than 8c)	
11. Mine fires (burned, suffocated, etc.)	
12. Other causes:	
(*a*) Fall of person	
(*b*) Machinery (other than 10)	
(*c*) Rush of coal or gob	
(*d*) Falling timber	
(*e*) Suffocation in chutes	
(*f*) Miscellaneous	
Total number killed inside of mines	
NUMBER KILLED IN SHAFT.	
13. Falling down shafts or slopes	
14. Objects falling down shafts or slopes	
15. Cages or skips	
16. Other causes:	
(*a*) Overwinding	
(*b*) Breaking of cables	
(*c*) Miscellaneous	
Total number killed by shaft accidents	

	Yards, shops, etc.	Strip pits.
NUMBER KILLED ON SURFACE.		
17. Mine cars and mine locomotives		
18. Electricity		
19. Machinery		
20. Boiler explosions or bursting steam pipes		
21. Railway cars and locomotives		
22. Other causes:		
(*a*) Explosives		
(*b*) Fall of person		
(*c*) Falling objects (derricks, booms, etc.)		
(*d*) Suffocation in chute, bin, or culm		
(*e*) Falls or slides of rock or coal		
(*f*) Steam shovels		
(*g*) Hand tools		
(*h*) Miscellaneous		
Total number killed on sur- or in strip pits		
Grand total		

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FORM B.—*Accidents at metal mines during the year ended December 31, ——.*

	Killed.	Seriously injured. (Time lost, more than 14 days.)			Slightly injured. (Time lost, 1 to 14 days.)
		Permanent total disability.[a]	Permanent partial disability.[b]	Others.	
UNDERGROUND.					
Number killed or injured by—					
1. Falls of rock or ore from roof or wall					
2. Handling rock or ore:					
(*a*) Loading at face					
(*b*) Loading at chute					
(*c*) Sledging					
3. Timber or hand tools					
4. Explosives:					
(*a*) Transportation					
(*b*) Charging					
(*c*) Suffocation					
(*d*) Drilling into old holes					
(*e*) Striking in loose rock or ore					
(*f*) Thawing					
(*g*) Caps, detonators, etc					
(*h*) Unguarded shots					
(*i*) Returned too soon					
(*j*) Premature shot					
(*k*) Miscellaneous					
5. Haulage:					
(*a*) Hand and animal					
(*b*) Mechanical					
6. Persons falling down chutes, winze, raise, or stope					
7. Run of ore from chute or pocket					
8. Drilling (by machine or hand drills)					
9. Electricity:					
(*a*) Direct contact with trolley wire					
(*b*) Tool or bar striking trolley wire					
(*c*) Contact with motor					
(*d*) Others					
10. Machinery other than 5 and 8					
11. Mine fires					
12. Suffocation from natural gases					
13. Inrush of water					
14. Nails and splinters					
15. Other causes:					
(*a*) Falling objects, other than 1 and 2					
(*b*) Flying objects, other than 2e					
(*c*) Burns					
(*d*) Miscellaneous					
Total number killed or injured underground					
SHAFT ACCIDENTS.					
Number killed or injured by—					
16. Falling down shafts					
17. Objects falling down shafts					
18. Breaking of cables					
19. Overwinding					
20. Cage, skip, or bucket:					
(*a*) Runaway					
(*b*) Riding with rock or ore					
(*c*) Riding with timber or tools					
(*d*) Struck by					
21. Other causes					
Total number killed or injured by shaft accidents					

[a] *Permanent total disability.*—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition incapacitating workman from doing any work of a gainful occupation.

[b] *Permanent partial disability.*—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

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FORM B.—*Accidents at metal mines during the year ended December 31,* ———Continued.

	Killed.	Seriously injured. (Time lost, more than 14 days.)			Slightly injured. (Time lost, 1 to 14 days.)
		Permanent total disability.	Permanent partial disability.	Others.	
SURFACE ACCIDENTS.					
(At surface plants and shops.)					
Number killed or injured by—					
22. Haulage:					
(*a*) Hand and animal					
(*b*) Mechanical					
23. Railway cars and locomotives					
24. Run or fall of ore in or from ore bins					
25. Falls of persons					
26. Nails and splinters					
27. Hand tools, axes, bars, etc					
28. Electricity:					
(*a*) Direct contact with trolley wire					
(*b*) Tool or bar striking trolley wire					
(*c*) Contact with motor					
(*d*) Others					
29. Machinery					
30. Other causes:					
(*a*) Falling objects					
(*b*) Flying objects					
(*c*) Burns					
(*d*) Miscellaneous					
Total number killed or injured by surface accidents					
OPEN-PIT ACCIDENTS.					
Number killed or injured in pit by—					
31. Falls or slides of rock or ore					
32. Explosives:					
(*a*) Transportation					
(*b*) Charging					
(*c*) Suffocation					
(*d*) Drilling into old holes					
(*e*) Striking in loose rock or ore					
(*f*) Thawing					
(*g*) Caps, detonators, etc					
(*h*) Unguarded shots					
(*i*) Returned too soon					
(*j*) Premature shot					
(*k*) Miscellaneous					
33. Haulage:					
(*a*) Hand and animal					
(*b*) Mechanical					
(*c*) Railway cars and locomotives					
34. Steam shovels					
35. Falls of persons					
36. Falls of derricks, booms, etc					
37. Run or fall of ore in or from ore bins					
38. Machinery (other than 33 and 34)					
39. Electricity:					
(*a*) Direct contact with trolley wire					
(*b*) Tool or bar striking trolley wire					
(*c*) Contact with motor					
(*d*) Others					
40. Hand tools					
41. Other causes:					
(*a*) Falling objects other than 31					
(*b*) Flying objects					
(*c*) Burns					
(*d*) Miscellaneous					
Total number killed or injured by open-pit accidents					
Grand total					

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FORM C.—*Accidents at quarries during the year ended December 31, ——.*

	Killed.	Seriously injured. (Time lost, more than 14 days.)			Slightly injured. (Time lost, 1 to 14 days.)
		Permanent total disability.[a]	Permanent partial disability.[b]	Others.	
IN AND ABOUT QUARRY.					
Number killed or injured by—					
1. Falls or slides of rock or overburden					
2. Handling rock at face					
3. Timber or hand tools					
4. Explosives:					
(*a*) Transportation					
(*b*) Charging					
(*c*) Drilling into old holes					
(*d*) Striking in loose rock					
(*e*) Thawing					
(*f*) Caps, detonators, etc					
(*g*) Unguarded shots					
(*h*) Returned too soon					
(*i*) Premature shot					
(*j*) Miscellaneous					
5. Haulage:					
(*a*) Hand and animal					
(*b*) Mechanical					
(*c*) Railway cars and locomotives					
6. Falling into quarry from surface, benches, or face					
7. Falling from hoists, derricks, ladders, etc					
8. Drilling and channeling (by machine or hand)					
9. Electricity					
10. Machinery:					
(*a*) Cables and attachments					
(*b*) Guys, masts, booms, derricks, and attachments					
(*c*) Pumps and hoisting engines					
(*d*) Other machinery					
11. Flying objects:					
(*a*) From sledging					
(*b*) Others					
12. Nails, splinters, etc					
13. Boiler and air-tank explosions					
14. Steam shovels					
15. Other causes					
Total killed or injured at quarries					

Number of wives left widows (at quarries).....
Number of children under 16 years of age left fatherless.....

[a] *Permanent total disability.*—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] *Permanent partial disability.*—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

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FORM C.—*Accidents at quarries during the year ended December 31,* ——Continued.

	Killed.	Seriously injured. (Time lost, more than 14 days.)			Slightly injured. (Time lost, 1 to 14 days.)
		Permanent total disability.	Permanent partial disability.	Others.	
OUTSIDE WORKS. (To include rock-dressing plants, crushers, cement mills, kilns, etc.) *Number killed or injured by—*					
16. Haulage:					
(*a*) Hand and animal					
(*b*) Mechanical					
17. Railway cars and locomotives					
18. Crushers					
19. Cranes, derricks, etc					
20. Other machinery					
21. Falls of persons					
22. Hand tools					
23. Electricity					
24. Nails, splinters, etc					
25. Flying objects:					
(*a*) From sledging or crushing					
(*b*) Others					
26. Falling objects (rocks, timbers, etc.)					
27. Burns					
28. Handling rock by hand					
29. Other causes					
Total number killed or injured at outside works					
Grand total					

Number of wives left widows (at outside works)
Number of children under 16 years of age left fatherless

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FORM D.—*Accidents at coke ovens during the year ended December 31, ——.*

	Beehive ovens.					By-product ovens.				
	Killed.	Seriously injured. (Time lost, more than 14 days.)			Slightly injured. (Time lost, 1 to 14 days).	Killed.	Seriously injured. (Time lost, more than 14 days.)			Slightly injured. (Time lost, 1 to 14 days.)
		Permanent total disability.[a]	Permanent partial disability.[b]	Others.			Permanent total disability.[a]	Permanent partial disability.[b]	Others.	
Killed or injured by:										
1. Cars, larries, and motors										
2. Railway cars and locomotives										
3. Coke-drawing machines										
4. Electricity										
5. Falls of persons										
6. Hand tools										
7 Suffocation from gases										
8. Burns										
9. Gas explosions										
10. Other causes										
Total number killed or injured										
	Number of wives left widows					Number of wives left widows				
	Number of children under 16 years of age left fatherless					Number of children under 16 years of age left fatherless				
Location of ovens:										
Post office										
State										

[a] *Permanent total disability.*—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating workman from doing any work of a gainful occupation.

[b] *Permanent partial disability.*—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

PUBLICATIONS ON ACCIDENT STATISTICS.

A limited supply of the following publications of the Bureau of Mines has been printed and is available for free distribution until the edition is exhausted. Requests for all publications can not be granted, and to insure equitable distribution applicants are requested to limit their selection to publications that may be of especial interest to them. Requests for publications should be addressed to the Director, Bureau of Mines.

The Bureau of Mines issues a list showing all its publications available for free distribution as well as those obtainable only from the Superintendent of Documents, Government Printing Office, on payment of the price of printing. Interested persons should apply to the Director, Bureau of Mines, for a copy of the latest list.

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PUBLICATIONS AVAILABLE FOR FREE DISTRIBUTION.

BULLETIN 115. Coal-mine fatalities in the United States, 1870–1914, with statistics of coal production, labor, and mining methods, by States and calendar years, compiled by A. H. Fay. 1916. 370 pp., 3 pls., 13 figs.

BULLETIN 140. Occupational hazards at blast-furnace plants and accident prevention, based on records of accidents at blast furnaces in Pennsylvania in 1915, by F. H. Willcox. 1917. 155 pp., 16 pls.

TECHNICAL PAPER 46. Quarry accidents in the United States during the calendar year 1911, compiled by A. H. Fay. 1913. 32 pp.

TECHNICAL PAPER 61. Metal-mine accidents in the United States during the calendar year 1912, compiled by A. H. Fay. 1913. 76 pp., 1 fig.

TECHNICAL PAPER 92. Quarry accidents in the United States during the calendar year 1913, compiled by A. H. Fay. 1914. 76 pp.

TECHNICAL PAPER 118. Coke-oven accidents in the United States during the calendar years 1913 and 1914, compiled by A. H. Fay. 1915. 16 pp.

TECHNICAL PAPER 124. Accidents at metallurgical works in the United States during the calendar years 1913 and 1914, compiled by A. H. Fay. 1915. 28 pp.

TECHNICAL PAPER 128. Quarry accidents in the United States during the calendar year 1914, compiled by A. H. Fay. 1915. 45 pp.

TECHNICAL PAPER 129. Metal-mine accidents in the United States during the calendar year 1914, compiled by A. H. Fay. 1915. 96 pp., 1 pl., 3 figs.

TECHNICAL PAPER 151. Coke-oven accidents in the United States during the calendar year 1915, compiled by A. H. Fay. 1916. 18 pp.

TECHNICAL PAPER 164. Accidents at metallurgical works in the United States during the calendar year 1915, compiled by A. H. Fay. 1916. 20 pp.

TECHNICAL PAPER 165. Quarry accidents in the United States during the calendar year, 1915, compiled by A. H. Fay. 1917. 77 pp., 1 pl.

TECHNICAL PAPER 168. Metal-mine accidents in the United States during the calendar year 1915, compiled by A. H. Fay. 1917. 114 pp., 2 figs.

TECHNICAL PAPER 173. Coke-oven accidents in the United States during the calendar year, 1916, compiled by A. H. Fay. 1917. 22 pp.

Coal-mine fatalities in the United States, 1916, compiled by A. H. Fay. 1917. 42 pp.

PUBLICATIONS THAT MAY BE OBTAINED ONLY THROUGH THE SUPERINTENDENT OF DOCUMENTS.

BULLETIN 69. Coal-mine accidents in the United States and foreign countries, compiled by F. W. Horton. 1913. 102 pp., 3 pls., 40 figs. 25 cents.

TECHNICAL PAPER 27. Monthly statement of coal-mine accidents in the United States, January to August, 1912, and statistics for 1910 and 1911, compiled by F. W. Horton. 1912. 24 pp. 5 cents.

TECHNICAL PAPER 40. Metal-mine accidents in the United States during the calendar year 1911, compiled by A. H. Fay. 1913. 54 pp. 5 cents.

TECHNICAL PAPER 48. Coal-mine accidents in the United States, 1896–1912, with monthly statistics for 1912, by F. W. Horton. 1913. 74 pp., 10 figs. 10 cents.

TECHNICAL PAPER 73. Quarry accidents in the United States during the calendar year 1912, compiled by A. H. Fay. 1914. 45 pp. 5 cents.

TECHNICAL PAPER 94. Metal-mine accidents in the United States during the calendar year 1913, compiled by A. H. Fay. 1914. 73 pp. 10 cents.

Coal-mine fatalities in the United States during the calendar year 1915, with detailed figures for December, compiled by A. H. Fay. 1916. 80 pp., 3 figs., 10 cents.

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